

Section 114 Request for Information to Whiting Petroleum Corporation

August 27, 2015

ENCLOSURE 1:

A. INSTRUCTIONS

1. Provide a separate narrative response to each request and subpart set forth in the Information Request. If Whiting has no responsive information or documents pertaining to a particular request, submit an affirmative statement and explanation.
2. Precede each answer with the number of the request to which it corresponds and at the end of each answer identify the person(s) (including name, title, and a description of job duties) that provided information that was used or considered in responding to that request, as well as each person (including name, title, and a description of job duties) who was consulted in the preparation of that response.
3. Indicate on each document produced in response to this Information Request, or in some other reasonable manner, the number of the request to which it corresponds. If a document is responsive to more than one request, this must be so indicated and only one copy of the document needs to be provided.
4. The EPA is providing an Excel workbook as Enclosure 5 for ease of organization of responses to Requests 1-3. Please populate the workbook with your responses to those Requests in accordance with all instructions here and therein, and in the units noted. Except for the information specifically requested to be in an Excel spreadsheet format, Whiting may choose to either submit documents in .pdf format or submit documents as hard copy documents. Electronic submissions are preferred to save paper and expenses.
5. When a response is provided in the form of a number, specify the units of measure of the number in a precise manner and the basis for the number provided (e.g., estimated, measured or engineering judgment).
6. Where documents or information necessary for a response are neither in your possession nor available to you, indicate in your response why such documents or information are not available or in your possession and identify any source that either possesses or is likely to possess such documents or information.

B. DEFINITIONS

All terms used in this information request will have their ordinary meaning unless such terms are defined in the Act, 42 U.S.C. § 7401 *et seq.*; 40 C.F.R. Part 49, Subpart K; 40 C.F.R. Part 60, Subpart OOOO; and/or other CAA implementing regulations.

Bakken Pool means Oil produced from the Bakken, Three Forks, and Sanish Formations.

Control device or its plural means the air pollution control equipment used to achieve VOC emission reductions, for example, enclosed flare, combustor, combustion device, vapor recovery unit, etc.

Document and writing and the plural forms thereof means all written, recorded or graphic matters, however produced or reproduced, of every kind and description, pertaining in any way to the subject

matter of this action. The terms "document" and "writing" shall include, but are not limited to: any receipts; invoices; shipping records; purchase orders; purchase records; books; pamphlets; periodicals; memoranda (including those of telephone or oral conversations); contracts; correspondence; agreements; applications; financial records; security instruments; disbursements; checks; bank statements; time records; accounting or financial records; notes; diaries; logs; facsimiles (faxes); telegrams or cables prepared, drafted, received or sent; electronic mail (emails), whether drafted, received or sent; tapes; transcripts; recordings; minutes and notes of meetings; directives; work papers; charts; drawings; prints; flow sheets; photographs; infrared camera recordings; film; computer printouts; x-ray photographs; advertisements; catalogs; data; sampling reports, plans, protocols, reports, analyses; or any handwritten, recorded, transcribed punched, taped, filmed or graphic matter, however produced or reproduced, in Whiting's possession, custody or control or to which Whiting has or has had access.

Enclosed combustor means a thermal oxidation system with an enclosed combustion chamber that maintains a limited constant temperature by controlling fuel and combustion air.

Flash emissions means entrained natural gas vapors or other emissions that are released from hydrocarbon liquids when exposed to temperature increases or pressure drops, for example such as when produced oil is transferred from production vessels to other vessels or to atmospheric storage tanks.

Oil means hydrocarbon liquids.

Oil and natural gas production facility means all of the air pollution emitting units and activities located on or integrally connected to one or more oil and natural gas wells that are used for production operations and storage operations.

Oil and natural gas well means a single well that extracts subsurface reservoir fluids containing a mixture of oil, natural gas, and water.

Owner or operator means any person who owns, leases, operates, controls, or supervises an oil and natural gas production facility.

Person or its plural or any synonym thereof, is intended to and shall embrace and include any individual, partnership, corporation, company, association, government agency (whether federal, state, local or any agency of the government of a foreign country) or any other entity.

Produced natural gas means natural gas that is separated from extracted reservoir fluids during production operations.

Produced oil means oil that is separated from extracted reservoir fluids during production operations.

Produced oil storage tank means a unit that is constructed primarily of non-earthen materials (such as steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of produced oil.

Produced water means water that is separated from extracted reservoir fluids during production operations.

Produced water storage tank means a unit that is constructed primarily of non-earthen materials (such as steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation

of produced water.

Well completion means the process that allows for the flowback of oil and natural gas from newly drilled wells to expel drilling and reservoir fluids and tests the reservoir flow characteristics, which may vent produced hydrocarbons to the atmosphere via an open pit or tank.

Working, breathing, standing (w/b/s) emissions means those emissions that can occur as vapors are displaced from the produced oil storage tank headspace when the tank is filled (working) or when there are temperature or pressure fluctuations in the produced oil storage tank that volatilize lighter ends (breathing/standing).

You and/or your means Whiting, and all its agents, servants, employees, representatives, investigators, accountants, auditors, attorneys, experts, consultants, contractors and others who are in possession, custody or control (actual or constructive) of relevant information that is otherwise available to you, or may have obtained information for or on behalf of, Whiting.

ENCLOSURE 2:

INFORMATION REQUESTED:

Using the instructions and definitions set forth in Enclosure 1, provide the following information within the time periods specified previously.

1. Column D (“Oil and Natural Gas Well Name(s)”) of Enclosure 5 includes a list of oil and natural gas wells located on a single well pad. Column B (“EPA-Assigned Tank Vapor Capture System #”) assigns a tank vapor capture system number to the oil and natural gas wells in Enclosure 5 in order to identify oil and natural gas well(s) for which vapors are routed to one tank or multiple tanks manifolded together. Please state whether the oil and natural gas well names associated with the tank vapor capture system numbers identified by the EPA in Enclosure 5 are correct. If they are incorrect (i.e. wells have been shut-in, added, or were never connected to that vapor capture system), please use column E (“Are the oil and natural gas well names correctly associated with their common tank vapor capture system #’s?”) and column F (“If incorrect, provide correct identification and explain”) in the workbook to provide correct identification and explain in accordance with the directions in row 4 (column headers) of the workbook.
2. For each tank vapor capture system listed in Enclosure 5 (reflecting any corrections made in response to Request 3), provide responses to the information requested below. Please use columns G (“If more than one storage tank is present within a tank vapor capture system, describe how oil flows between storage tanks.”) through AR (“The combustor manufacturer specifications showing the maximum flow rate of tank vapors under which a control efficiency of at least 98% for volatile organic compounds can be achieved.”) and in accordance with the directions provided in row 4 (column headers) of the Enclosure 5 workbook to provide the following information:
 - a. If more than one storage tank is present within a tank vapor capture system, describe how produced oil flows between the storage tanks.
 - b. Provide how the production from those wells is set to flow to the initial separator(s) (e.g. continuous pump, based on time, pressure, other parameter(s), or a combination of these).
 - c. Provide a description, name and tag # ID of the initial separator(s) (e.g. single stage, dual stage, dual coil, HLP, VGR, etc.). For each stage of the initial separator(s) provide the following:
 - i. The maximum operating pressure (psig) and temperature (°F).
 - ii. If more than one stage in the initial separator(s), describe where flash emissions from subsequent stages of initial separator(s) are routed.
 - iii. Whether or not the final separator stage features a device on the liquid outlet line to prevent a vortex from forming during a liquid dump event which could lead to unintentional gas carry through. Provide a narrative description of the device.

- d. State whether there is an intermediate separation vessel(s) between the initial separator and the storage tank(s). If so, provide:
 - i. The maximum operating pressure (psig) and temperature (°F).
 - ii. Describe where flash emissions from the intermediate separation vessel(s) are routed.
- e. Provide the interior pipe diameter (inches) from the separation vessel immediately upstream of the storage tank(s) for (if the interior pipe diameter is not available, measure the separator outlet exterior pipe diameter, and so note):
 - i. The produced oil outlet pipe.
 - ii. The produced water outlet pipe.
- f. Provide the orifice plate diameter (inches) and make, model, size and trim of the liquid dump valve from the separation vessel immediately upstream of the storage tank(s) for:
 - i. The produced oil outlet pipe.
 - ii. The produced water outlet pipe.
- g. State whether the flow of liquids from the separation vessel immediately upstream of the storage tank(s) is continuous or is in intermittent batches.
- h. If the flow of liquids from the separation vessel(s) immediately upstream of the storage tank(s) is in intermittent batches, provide:
 - i. A narrative description of what triggers a liquid dumping event.
 - ii. The maximum produced oil volume (barrels) of the separation vessel immediately upstream of the storage tank.
 - iii. The maximum produced water volume (barrels) of the separation vessel immediately upstream of the storage tank.
 - iv. An estimate of the peak instantaneous produced oil flow rate during a dumping event. This may be estimated using the following method:

$$\text{Instantaneous flow rate} = \text{average daily production (barrels)} / (\text{dumping frequency (dumping events per day)} \times \text{duration of a dumping event (hours)}).$$
 The average daily production should be calculated based on well operating hours and produced oil production for July 2014.
 - v. An estimate of the peak instantaneous produced water flow rate during a dumping event. This may be estimated using the following method:

$$\text{Instantaneous flow rate} = \text{average daily production (barrels)} / (\text{dumping frequency (dumping events per day)} \times \text{duration of a dumping event (hours)}).$$
 The average daily production should be calculated based on well operating hours and produced water production for July 2014.
- i. If the flow of liquids from the separation vessel(s) immediately upstream of the storage tank(s) is continuous, provide:
 - i. The maximum produced oil pump rate from the separation vessel immediately upstream of the storage tank.

- ii. The maximum produced water pump rate from the separation vessel immediately upstream of the storage tank.
 - j. For each tank vapor capture system, provide the number of associated storage tank(s) and their volume (barrels). For this request, associated storage tank means a tank whose vapors are captured and conveyed to a tank vapor capture system.
 - k. Describe the storage tank vapor capture system which routes tank vapors to the on-site control device by providing the following:
 - i. Pressure relief settings (psi) on both the thief hatch and the pressure relief valve on any storage tank(s) or tank vapor capture system. Note any changes in pressure relief settings that may have occurred, include the original and modified settings and date(s) when changed.
 - ii. Pipe length (feet) from the storage tank(s) to the control device (if the vapor capture system collects vapor from multiple tanks, use the average pipe length for all the storage tanks to the control device).
 - iii. Inner pipe diameter (inches) of the tank vapor capture system from the storage tank(s) to the control device.
 - iv. Number of short radius elbows (short radius elbows have a radius equal to the pipe diameter).
 - v. Number of long radius elbows (long radius elbows have a radius 1.5 times the pipe diameter).
 - vi. Number and type of valves (e.g. gate, check, globe, etc.).
 - vii. If the control device is a combustor, provide the rated pressure loss across the combustor burner assembly as provided by the manufacturer of the combustion device (psi).
 - viii. Describe any low points in the tank vapor collection system piping where liquids could accumulate. Describe the frequency of draining these liquids. Describe the indicator, if any, that notifies the operator that liquids must be drained.
 - ix. Set-point pressure (ounces per square inch) and maximum flow capacity (scf/hr) at that set-point of any backpressure valves installed on the vapor collection system.
 - x. Flame arrestor information including make, model, size and performance curve showing the pressure loss as a function of the flow rate. List the filenames if provided electronically or an Attachment name identifier if hard copy.
 - l. Identify the type of control device used (e.g. open flare, enclosed combustion device, VRU, etc.). If a combustor is used, provide the following:
 - i. The combustor manufacturer specifications showing the maximum flow rate of tank vapors under which a control efficiency of at least 98% for volatile organic compounds can be achieved (scf/hr).
3. For well pads listed in rows 5-9 only, provide the following analytical results for at least one well from which produced oil and/or produced water is routed to one tank or multiple tanks manifolded together and controlled with that vapor capture system (see column D). The analytical results shall be recorded in columns AS ("Filename of extended hydrocarbon liquid analysis of a pressurized oil sample from the pressurized vessel immediately upstream of the

storage tank(s)”) through column AU (“Reid Vapor Pressure of the produced oil in the storage tank(s)”) and in accordance with the directions provided in row 4 (column headers) of the Enclosure 5 workbook:

- a. An extended hydrocarbon liquid analysis of a pressurized oil sample and a pressurized produced water sample from the pressurized vessel immediately upstream of the storage tank(s). Follow the test procedure found in appendix B to the California Air Resource Board’s (CARB) Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. The CARB test procedure may be found on page 271 of the document at the following link: <http://www.arb.ca.gov/cc/reporting/ghg-rep/regulation/mrr-2014-unofficial-02042015.pdf>.

If such samples and analyses have been done within the past 12 months, you may provide that data in lieu of analyzing new samples. Include a copy of the lab analysis report showing:

- i. The protocol or test procedure used to collect and analyze the samples.
- ii. Date of each sample collection.
- iii. Start and end times for each sample collection and the duration of time that the samples were collected over (minutes).
- iv. Name of oil and natural gas wells associated with the pressurized vessel sampled.
- v. Description of where, within the oil and natural gas production process, the sample was collected.
- vi. Operating temperature (°F) and pressure (psi) of the vessel at the time the sample was collected.
- vii. The pressure (psi) of the sample at the time it was received by the laboratory.

At least 15 days prior to sampling, please provide a sampling protocol and schedule of sampling locations to Scott Patefield at EPA Region 8, at patefield.scott@epa.gov.

- b. API Gravity and Reid Vapor Pressure (RVP) (psia) of the produced oil in the storage tank(s).

ENCLOSURE 3

STATEMENT OF CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations pursuant to section 113(c)(2) of the Clean Air Act, and 18 U.S.C. §§ 1001 and 1341.

(Signature)

(Printed Name)

(Title)

(Date)

ENCLOSURE 4

Confidential Business Information (CBI) Assertion and Substantiation Requirements

You may assert a business confidentiality claim covering all or part of the information you provide in response to this information request for any business information entitled to confidential treatment under section 114(c) of the Clean Air Act (the Act), 42 U.S.C. § 7414(c), and 40 C.F.R. Part 2, subpart B. Under section 114(c) of the Act, you are entitled to confidential treatment of information that would divulge methods or processes entitled to protection as trade secrets. Under 40 C.F.R. Part 2, subpart B, business confidentiality means “the concept of trade secrecy and other related legal concepts which give (or may give) a business the right to preserve the confidentiality of business information and to limit its use or disclosure by others in order that the business may obtain or retain business advantages it derives from its rights in the information.” 40 C.F.R. § 2.201(e).

Information covered by a claim of business confidentiality will be disclosed by the EPA only to the extent, and by means of the procedures, set forth in section 114(c) of the Act and 40 C.F.R. Part 2, subpart B. If you fail to furnish a business confidentiality claim with your response to this information request, the EPA will construe your failure as a waiver of that claim, and the information may be made available to the public without further notice to you.

To assert a business confidentiality claim, you must place on (or attach to) all information you desire to assert as business confidential either a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as “trade secret,” “proprietary,” or “company confidential” at the time you submit your response to this information request. Allegedly confidential portions of otherwise non-confidential documents should be clearly identified, and may be submitted separately to facilitate identification and handling by the EPA. You should indicate if you desire confidential treatment only until a certain date or until the occurrence of a certain event.

The criteria the EPA will use in determining whether material you claim as business confidential is entitled to confidential treatment are set forth at 40 C.F.R. §§ 2.208 and 2.301. These regulations provide, among other things, that you must satisfactorily show that: (1) the information is within the scope of business confidentiality as defined at 40 C.F.R. § 2.201(e); (2) that you have taken reasonable measures to protect the confidentiality of the information and that you intend to continue to do so; (3) the information is not and has not been reasonably obtainable by legitimate means without your consent; and (4) the disclosure of the information is likely to cause substantial harm to your business’s competitive position. See 40 C.F.R. § 2.208 (a)-(d). Emission data, as defined at 40 C.F.R. § 2.301(a)(2), is expressly not entitled to confidential treatment under 40 C.F.R. Part 2, subpart B. See 42 U.S.C. § 7414(c); 40 C.F.R. § 2.301(e).

If you assert a claim of business confidentiality in connection with information and documents forwarded in response to this request for information, in accordance with 40 C.F.R. § 2.204(e)(4), the EPA is requesting that you answer the following questions with respect to any information or document for which you assert a claim of business confidentiality:

1. What specific portions of the information are alleged to be entitled to confidential treatment?
Specify by page, paragraph and sentence when identifying the information subject to your claim.

2. For what period of time do you request that the information be maintained as confidential, e.g., until a certain date, until the occurrence of a specified event, or permanently? If the occurrence of a specific event will eliminate the need for confidentiality, specify that event. Additionally, explain why the information should be protected for the time period you have specified.
3. What measures have you taken to protect the information claimed as confidential from undesired disclosure? Have you disclosed the information to anyone other than a governmental body or someone who is bound by an agreement not to disclose the information further? If so, why should the information still be considered confidential?
4. Is the information contained in any publicly available material such as the Internet, publicly available databases, promotional publications, annual reports or articles? Is there any means by which a member of the public could obtain access to the information? Is the information of a kind that you would customarily not release to the public?
5. Has any governmental body made a determination as to the confidentiality of the information? If so, please attach a copy of the determination.
6. For each category of information claimed as confidential, explain with specificity whether disclosure of the information is likely to result in substantial harm to your competitive position. Explain the specific nature of those harmful effects, why they should be viewed as substantial and the causal relationship between disclosure and such harmful effects. How could your competitors make use of this information to your detriment?
7. Is there any other explanation you deem relevant to the EPA's determination of your business confidentiality claim that is not covered in the preceding questions? If so, you may provide such additional explanation.

Submit your answers to the above questions concurrently with your response to this information request if you have claimed any information as business confidential. See 40 C.F.R. § 2.204(e)(2). Pursuant to 40 C.F.R. § 2.205(b)(2), you may request an extension of this deadline. The EPA will construe your failure to furnish timely comments as a waiver of your confidentiality claim, consistent with 40 C.F.R. § 2.204(e)(1). Please submit your comments to:

David Rochlin
U.S. EPA Region 8
1595 Wynkoop Street (ENF-L)
Denver, CO 80202-1129
(303) 312-6892

Pursuant to 40 C.F.R. § 2.205(c), you are hereby advised that information you submit as part of your answers or comments may be regarded by the EPA as entitled to confidential treatment if, when it is received by the EPA, it is marked in accordance with 40 C.F.R. § 2.203(b). As required by 40 C.F.R. § 2.204(e)(6), you may assert a business confidentiality claim covering all or part of your response to these questions, as provided in 40 C.F.R. § 2.203(b). Information covered by such a claim will be disclosed by the EPA only to the extent, and by means of the procedures, set forth in section 114(c) of the Act and 40 C.F.R. Part 2. The EPA will construe the failure to furnish a confidentiality claim with your comments as a waiver of that claim, and the information may be made available to the public without further notice to you.

| | A | B | C | D | E | F | G |
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| 1 | Whiting | | | ResponseToQuestions | | | |
| 2 | ENCLOSURE 5 | | | | | | |
| 3 | REQUEST # >>> | | | | | 1 | 2(a) |
| 4 | EPA-Assigned Tank Vapor Capture System # | Field Name | Oil and Natural Gas Well Name(s) | Are the oil and natural gas well names correct? [Yes or No] | If incorrect, provide correct identification and explain. [Add or delete rows as necessary to include all associated oil and natural gas wells with common tank vapor capture systems] | If more than one storage tank is present within a tank vapor capture system, describe how oil flows between storage tanks. | |
| 5 | 2 Heart Butte | SKUNK CREEK 12-7-8-9H3, SKUNK CREEK 12-7-8-9H | | | | | |
| 6 | 4 Moccasin Creek | MOCCASIN CREEK 13-34-28-1H, MOCCASIN CREEK 13-34-28-2H, MOCCASIN CREEK 13-34-3H, MOCCASIN CREEK 4-3-34-3H3, MOCCASIN CREEK 4-3-34-4H, | | | | | |
| 7 | 10 Sanish | BEHR 11-34H | | | | | |
| 8 | 12 Sanish | ANDERSON 44-10H | | | | | |
| 9 | 14 Traux | P SCANLAN 153-98-16S-9-11-16H TWO SHIELDS BUTTE 14-33-6H, TWO | | | | | |
| 10 | 1 Heart Butte | SHIELDS BUTTE 14-33-28H | | | | | |
| 11 | 3 Heart Butte | SKUNK CREEK 13-18-17-16H3, SKUNK CREEK 13-18-17-9H | | | | | |
| 12 | 5 Moccasin Creek | MOCCASIN CREEK 16-26-27-12H, MOCCASIN CREEK 16-26-27-13H3 | | | | | |
| 13 | 6 Moccasin Creek | MOCCASIN CREEK 14-11-2-3H3 SKUNK CREEK 2-8-17-14H3, SKUNK | | | | | |
| 14 | 7 South Fork | CREEK 2-8-17-15H SKUNK CREEK 1-8-17-15H, SKUNK CREEK 1-8-17-15H3, SKUNK CREEK 1-8- | | | | | |
| 15 | 8 South Fork | 17-16H, SKUNK CREEK 1-8-17-16H3 SKUNK CREEK 4-8-17-13H3, SKUNK CREEK 4-8-17-13H, SKUNK CREEK 4-8- | | | | | |
| 16 | 9 South Fork | 17-14H3, SKUNK CREEK 4-8-17-14H | | | | | |
| 17 | 11 Sanish | RIGEL STATE 11-16H P THOMAS 153-98-5-10-11-8H, P | | | | | |
| 18 | 13 Traux | THOMAS 153-98-5-10-11-1H P VANCE 154-97-4-17-20-13H3A, P VANCE 154-97-4-17-20-14H, P VANCE | | | | | |
| 19 | 15 Traux | 154-97-4-17-20-13H, P VANCE 154-97-4-17-20-13H3 | | | | | |

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| 3 | 2(b) | 2(c) | 2(c)(i) | | 2(c)(ii) | 2(c)(iii) | |
| 4 | How is production from those wells set to flow to the initial separator(s) (e.g. continuous pump, based on time, pressure, other parameter(s), or a combination of these)? | Provide a description, name and tag # ID of the initial separator(s) (e.g. single stage, dual stage, dual coil, HLP, VGR, etc.). | 1st Stage - Maximum operating pressure and temperature. [psig and °F] | 2nd Stage - Maximum operating pressure and temperature. [psig and °F] [If applicable] | 2nd Stage - describe where flash emissions from this stage is routed. [If applicable] | Does the final separator stage feature a device on the liquid outlet line to prevent a vortex from forming during a liquid dump event? [Yes or No] | If yes, provide a narrative description. |
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| 4 | Is there an intermediate separation vessel(s) between the initial separator and the storage tank(s)? [Yes or No] | Intermediate separation vessel - Maximum operating pressure and temperature. [psig and °F] [If applicable] | Describe where flash emissions from the intermediate separation vessel(s) are routed. [If applicable] | Oil outlet pipe interior diameter from the separation vessel immediately upstream of the storage tank(s). [inches] | Produced water outlet pipe interior diameter from the separation vessel immediately upstream of the storage tank(s). [inches] | Oil outlet pipe orifice plate diameter and make, model, size and trim of the liquid dump valve from the separation vessel immediately upstream of the storage tank(s). [inches] | Produced water outlet pipe orifice plate diameter and make, model, size and trim of the liquid dump valve from the separation vessel immediately upstream of the storage tank(s). [inches] |
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| 4 | Is the flow of liquid from the separation vessel immediately upstream of the storage tank(s) continuous or in intermittent batches? | If intermittent batches, what triggers a liquid dumping event? | Maximum oil volume of the separation vessel immediately upstream of the storage tank(s). [barrels] | Maximum produced water volume of the separation vessel immediately upstream of the storage tank(s). [barrels] | Average daily oil production during July 2014. Exclude any duration the well was not in operation. [bbl/day] | Peak Instantaneous flow rate of oil during dump event from the separator to the storage tank(s). [gallons/minute] | Average daily produced water production during July 2014. Exclude any duration the well was not in operation. [bbl/day] | Peak Instantaneous flow rate of produced water during dump event from the separator to the storage tank(s). [gallons/minute] | Maximum pump rate of the oil from the separator to the storage tank(s). [gallons/minute] |
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| 3 | 2(i)(ii) | 2(j) | 2(k)(i) | 2(k)(ii) | 2(k)(iii) | 2(k)(iv) | 2(k)(v) | 2(k)(vi) |
| 4 | Maximum pump rate of the produced water from the separator to the storage tank(s). [gallons/minute] | For each tank vapor capture system, provide the number of associated storage tank(s) and their volume. [# and barrels] | Pressure relief settings (psi) on the thief hatch and pressure relief valve on the storage tank(s) or tank vapor capture system. Note any changes in pressure relief settings that may have occurred, include the original and modified seeings and date(s) when changed. [psi & Date] | Pipe length from the storage tank(s) to the control device (if the vapor capture system collects vapor from multiple tanks, use the average pipe length for all the storage tanks to the control device). [feet] | Inner pipe diameter of the tank vapor capture system from the storage tank(s) to the control device. [inches] | Number of short radius elbows (short radius elbows have a radius equal to the pipe diameter). [#] | Number of long radius elbows (long radius elbows have a radius 1.5 times the pipe diameter). [#] | Number and type of valves (e.g. gate, check, globe, etc.). [# and Type] |
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| 3 | 2(k)(vii) | 2(k)(viii) | 2(k)(ix) | 2(k)(x) | 2(l) | 2(l)(i) |
| 4 | Rated pressure loss across the combustor (combustion device) burner assembly as provided by the manufacturer of the combustion device. [psi] | Describe any low points in the tank vapor collection system piping where liquids could accumulate. Describe the frequency of draining these liquids. Describe the indicator, if any, that notifies the operator that liquids must be drained. | Set-point pressure and maximum flow capacity of any backpressure valves installed on the vapor collection system. [ounces/in ² and scf/hr] | Flame arrestor information including make, model, size and performance curve showing the pressure loss as a function of the flow rate [list the filenames if provided electronically or an Attachment name identifier if hard copy] | Identify the type of control device used (e.g. open flare, enclosed combustion device, VRU, etc.). | The combustor manufacturer specifications showing the maximum flow rate of tank vapors under which a control efficiency of at least 98% for volatile organic compounds can be achieved. [list the filenames if provided electronically or an Attachment name identifier if hard copy] [scf/hr] |
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